EMX-GM45

Mini-ITX Intel® GM45

Quick Installation Guide

1st Ed – 16 September 2009

Part NO. E2017GM4501R

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

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2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

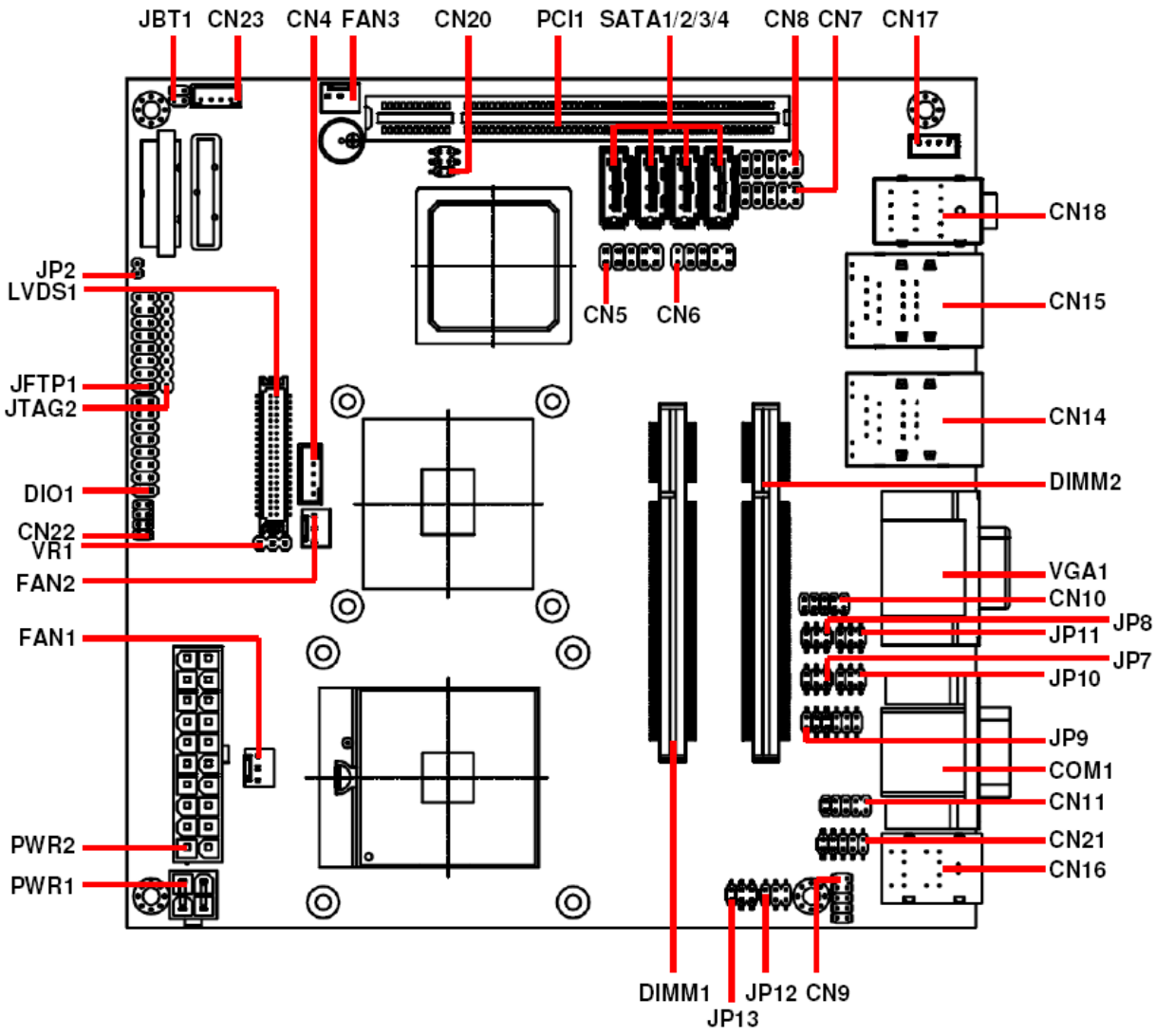
Before you begin installing your single board, please make sure that the following parts have been shipped.

- 1 x Intel® GM45 Mini ITXe Main board
- 1 x DVD-ROM contains the followings:
  - User's Manual in PDF file
  - Drivers
- 1 x COM cable (2.0mm pitch)
- 2 x SATA & Power cable

If any of the above items is damaged or missing, contact your retailer.

2. Hardware Configuration

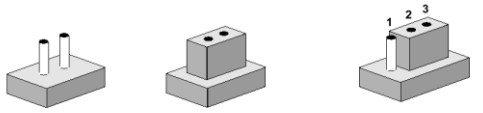
2.1 Product Overview



2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



Open Closed Closed 2-3

The jumper settings are schematically depicted in this manual as follows:

Open Closed Closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

Label	Function	Note
CN22	SRAM Address mode selec	4 x 2 header, pitch 2.0mm
JFTP1	Front Panel Jumper select	8 x 2 header, pitch 2.54mm
JP7	Serial port 2 pin-9 power select – Ring, +5V, +12V	3 x 2 header, pitch 2.0mm
JP8	Serial port 5 power select – Ring, +5V, +12V	3 x 2 header, pitch 2.0mm
JP9	Serial port 2 mode select in RS-232/422/485 mode	6 x 2 header, pitch 2.0mm
JP10	Serial port 1 pin-9 power select – Ring, +5V, +12V	3 x 2 header, pitch 2.0mm
JP11	Serial port 2 in RS-232/485/422	3 x 2 header, pitch 2.0mm
JP12	Serial port 3 power select – Ring, +5V, +12V	3 x 2 header, pitch 2.0mm
JP13	Serial port 4 power select – Ring, +5V, +12V	3 x 2 header, pitch 2.0mm

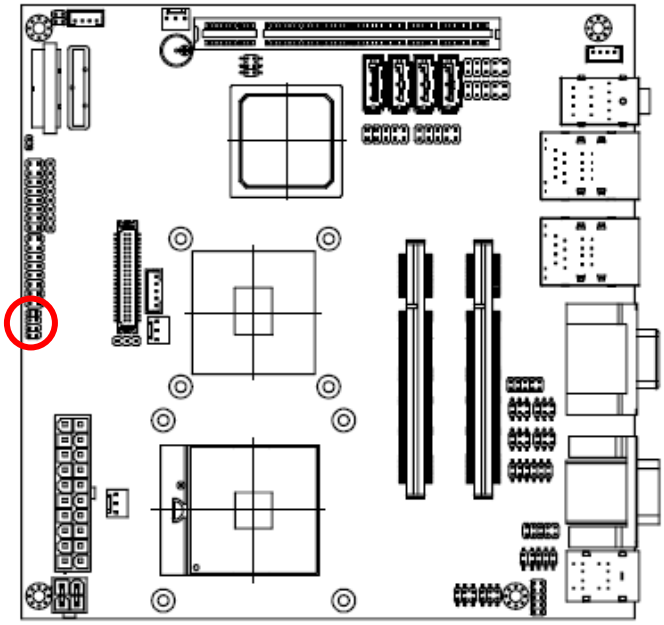
Connectors

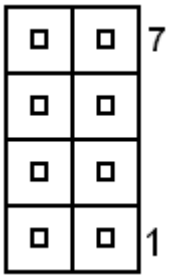
Label	Function	Note
CN4	LCD inverter connector	5 x 1 wafer, pitch 2.0mm
CN5	USB connector 4&5	5 x 2 header, pitch 2.54mm
CN6	USB connector 6&7	5 x 2 header, pitch 2.54mm
CN7	Front Audio connector	5 x 2 header, pitch 2.54mm
CN8	Side Audio connector	5 x 2 header, pitch 2.54mm
CN9	Serial port 4 connector	5 x 2 header, pitch 2.0mm
CN10	Serial port 5 connector	5 x 2 header, pitch 2.0mm
CN11	Serial port 3 connector	5 x 2 header, pitch 2.0mm
CN14	USB connector 0 & 1 & RJ45 connector 1	
CN15	USB connector 2 & 3 & RJ45 connector 2	
CN16	PS/2 keyboard & mouse connector	
CN17	CD-in connector	4 x 1 wafer, pitch 2.0mm
CN18	Audio Jack	
CN20	SPI connector	3 x 2 header, pitch 2.0mm
CN21	Serial port 6 connector	5 x 2 header, pitch 2.0mm
CN23	Speaker out connector	4 x 1 wafer, pitch 2.0mm
COM1	Serial port connector	D-sub 9-pin, male
DIMM1	200pin DDR2 SODIMM Socket	
DIMM2	200pin DDR2 SODIMM Socket	
DIO1	General purpose I/O connector	8 x 2 header, pitch 2.54mm
FAN1	CPU fan connector	3 x 1 wafer, pitch 2.54mm
FAN2	System fan connector	3 x 1 wafer, pitch 2.54mm
FAN3	AUX fan connector	3 x 1 wafer, pitch 2.54mm
JBT1	Clear CMOS	2 x 2 header, pitch 2.0mm
JP2	SRAM clear connector	2 x 1 header, pitch 2.0mm
JTAG2	GPLD connector	8 x 1 header, pitch 2.54mm
LVDS1	LVDS connector	
PCI1	PCI slot	
PWR1	ATX-12V power connector	2 x 2 wafer, pitch 4.2mm
PWR2	ATX power connector	10 x 2 wafer, pitch 4.2mm
SATA1	Serial ATA connector 1	
SATA2	Serial ATA connector 2	
SATA3	Serial ATA connector 3	
SATA4	Serial ATA connector 4	

VGA1	VGA connector 1 & 2	D-sub 15-pin, female
VR1	LVDS Back Light control connector	3 x 1 header, pitch 2.54mm

2.3 Setting Jumpers & Connectors

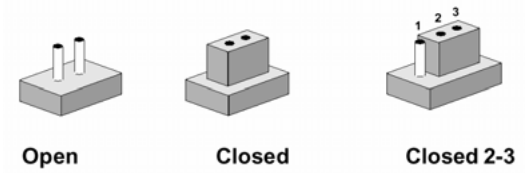
2.4.1 SRAM Address mode select (CN22)





Signal	PIN	PIN	Signal
IO_S1	8	7	GND
IO_S0	6	5	GND
ROM_S1	4	3	GND
ROM_S0	2	1	GND

1. * default setting
2. Jumper setting



*Default

IO_S1	IO_S0	
0	0	200H*
0	1	210H
1	0	220H
1	1	230H

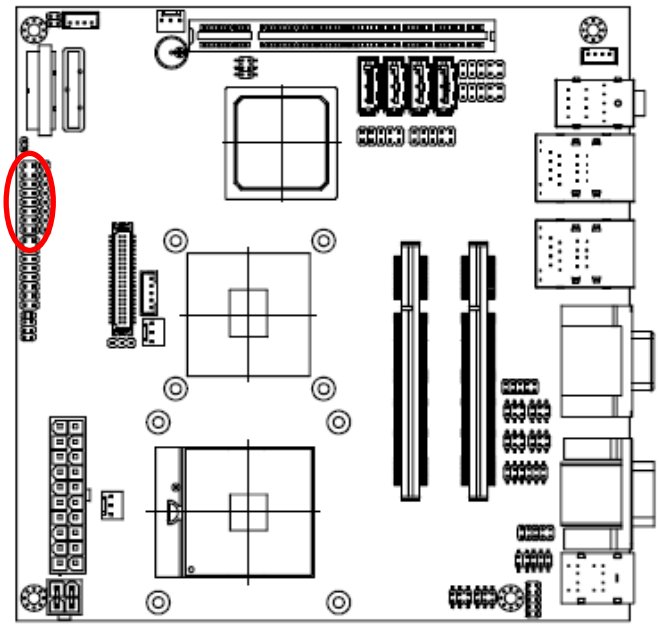
ROM_S1	ROM_S0	SRAM
0	0	D0H*
0	1	D8H
1	0	E0H
1	1	E8H

The SRAM on EMX-GM45 is divided into lots of banks. Each memory bank is 16K bytes in size. The number of memory bank depends on the size of memory chip used on the main-board. For example, if 512K bytes of memory are populated on board, the number of memory bank will start form 0 to 32. In order to access the memory, you have to assign the bank number at first. Then the data can be accessed form the pre-arranged memory base address.

Table Format of the Memory Bank Selection

Register	I/O BASE ADDRESS	I/O MODE	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Bank Select	+0	W	A7	A6	A5	A4	A3	A2	A1	A0

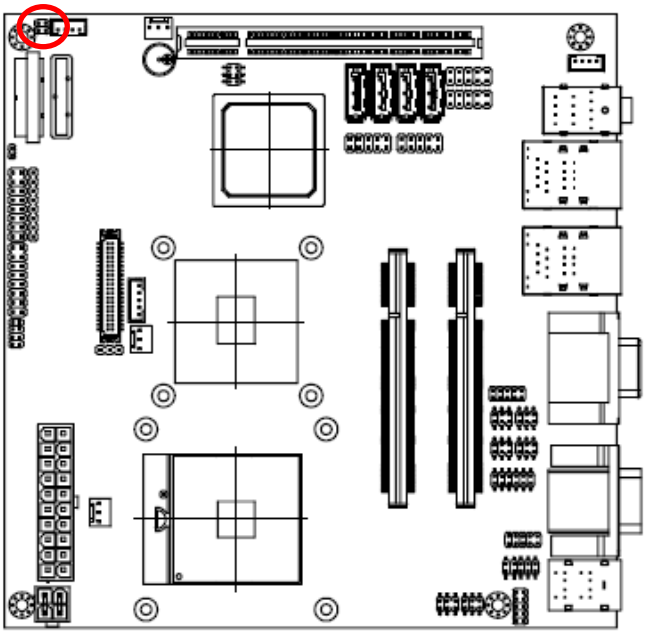
2.4.2 Front Panel Jumper select (JFTP1)

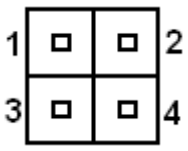


Signal	PIN	PIN	Signal
AUX TIN	1,3	2,4	OPEN: CF SLAVS
HDD LED	5,7	6,8	BUZZER
RESET	9,11	10,12	PWR LED
PWRBTN	13,15	14,16	OPEN: AT SHORT: ATX

*Default

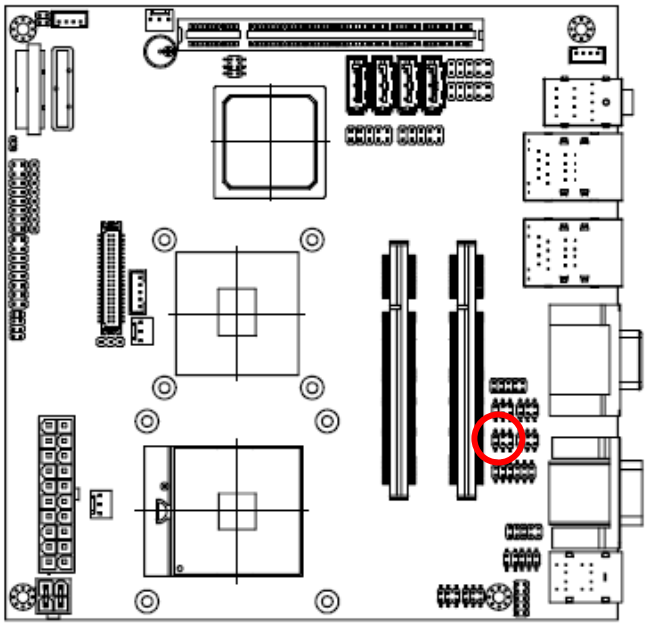
2.4.3 Clear CMOS (JBT1)



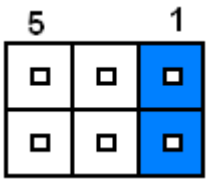


PIN	Signal	PIN	PIN
RTC_RST#	1	2	GND
GND	3	4	SRTC_RST#

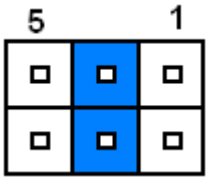
2.4.4 Serial port 2 pin-9 power select – Ring, +5V, +12V (JP7)



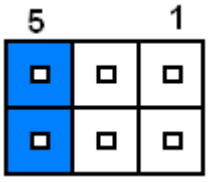
Ring*



+5V

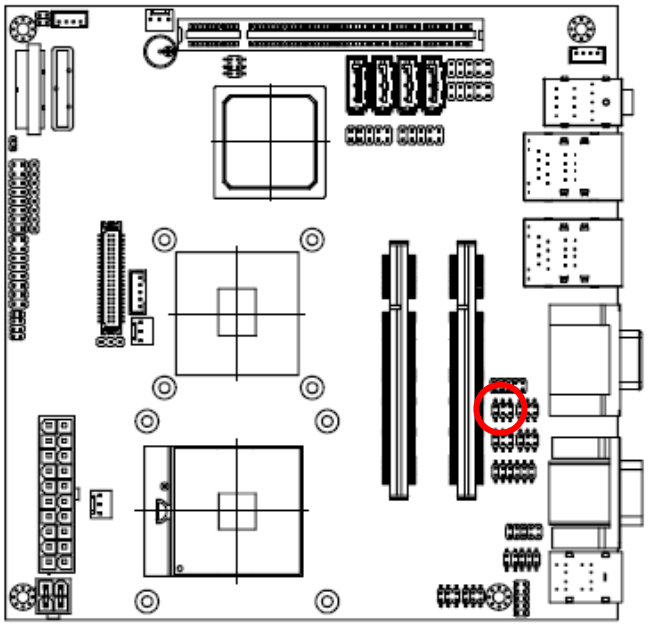


+12V

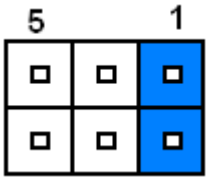


*Default

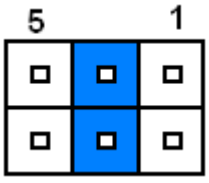
2.4.5 Serial port 5 power select – Ring, +5V, +12V (JP8)



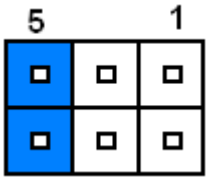
Ring*



+5V

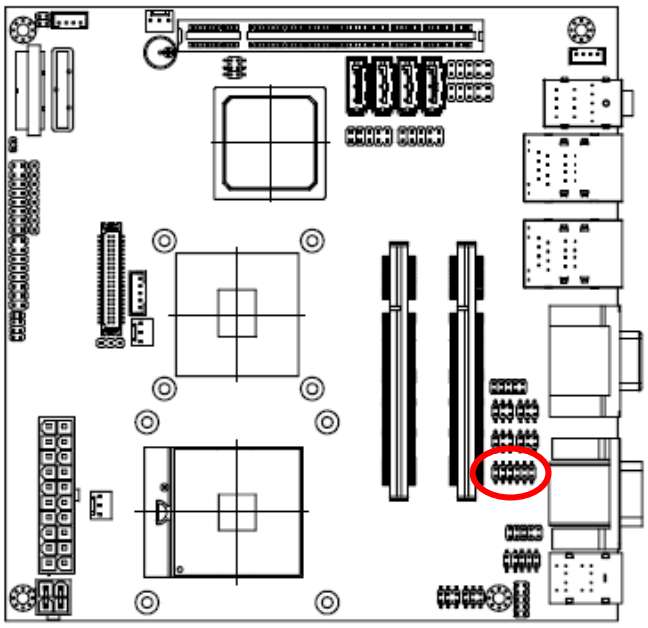


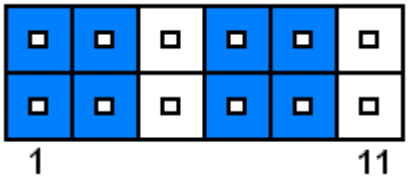
+12V

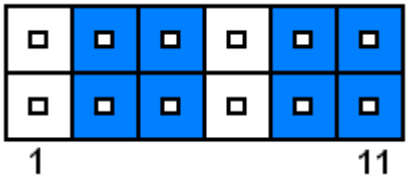


*Default

2.4.3 Serial port 2 mode select in RS-232/422/485 mode (JP9)



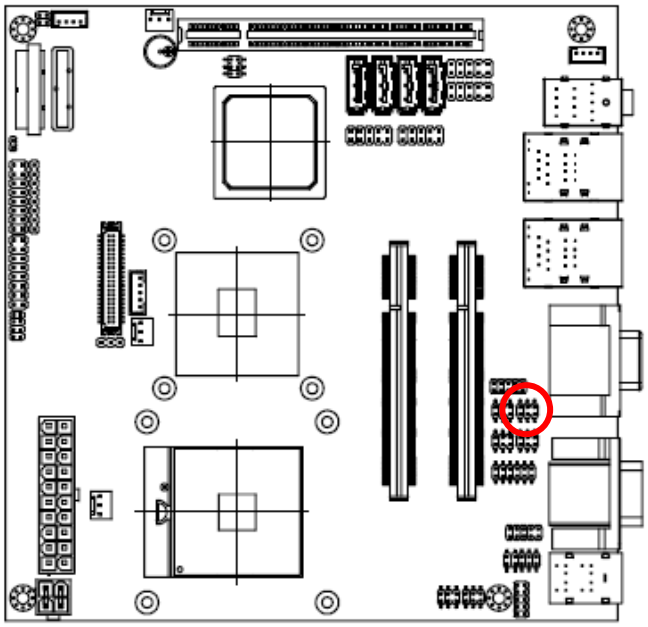


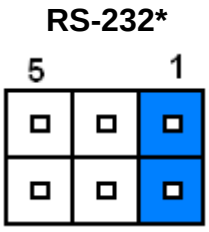


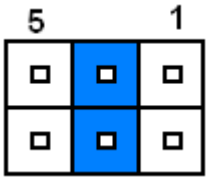
	RS-232	RS-422/485
CM2-1	1-3	3-5
CM2-2	2-4	4-6
CM2-3	7-9	9-11
CM2-4	8-10	10-12

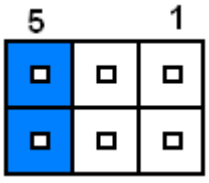
*Default

2.4.4 Serial port 2 in RS-232/485/422 (JP11)



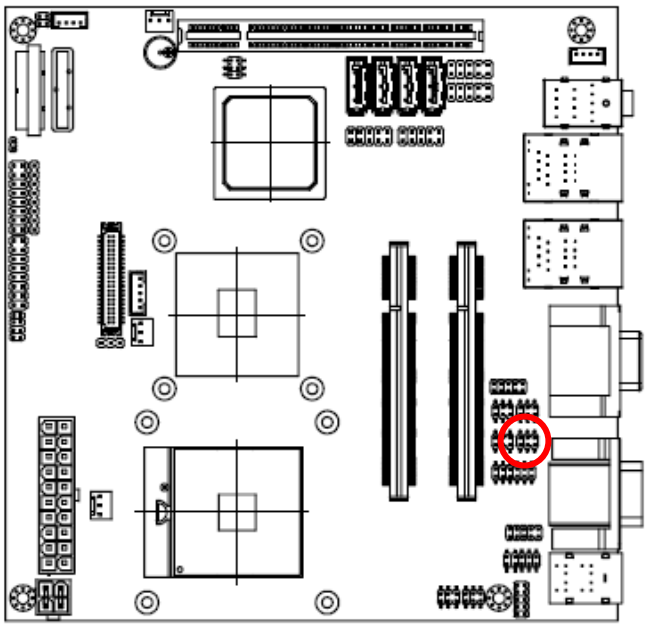


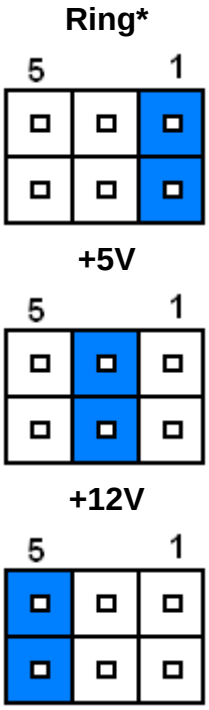




*Default

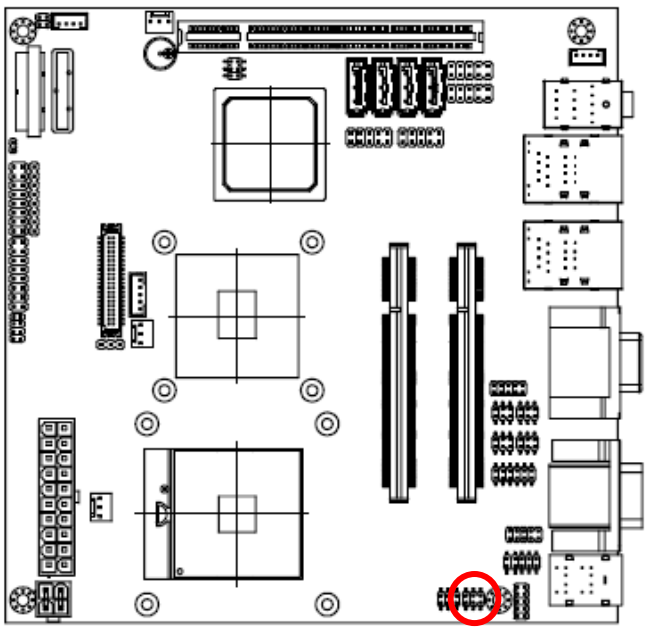
2.4.5 Serial port 1 pin-9 power select – Ring, +5V, +12V (JP10)

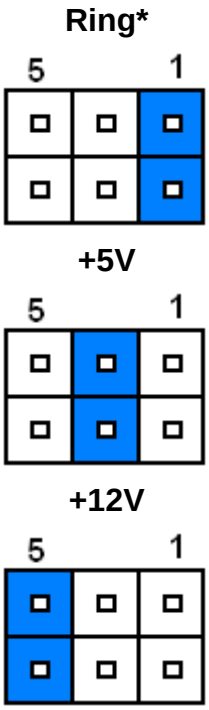




*Default

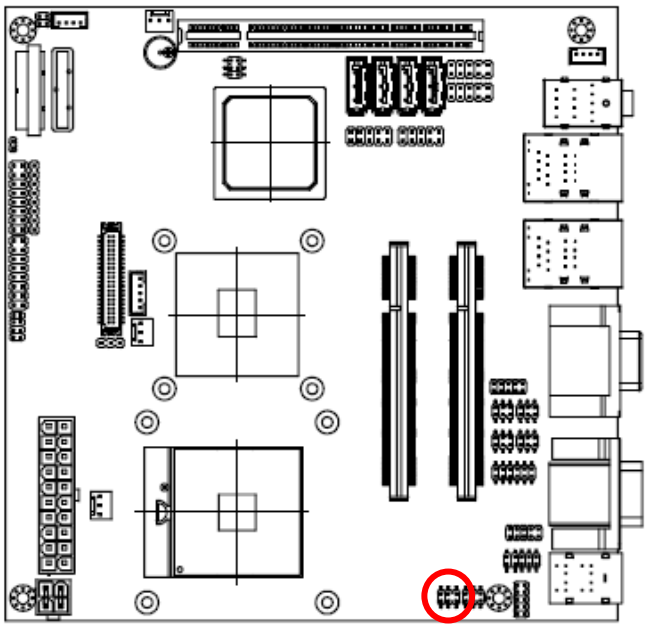
2.4.6 Serial port 3 power select – Ring, +5V, +12V (JP12)

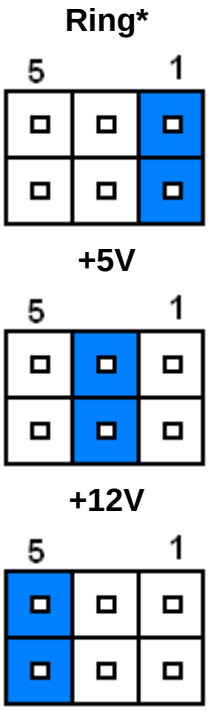




*Default

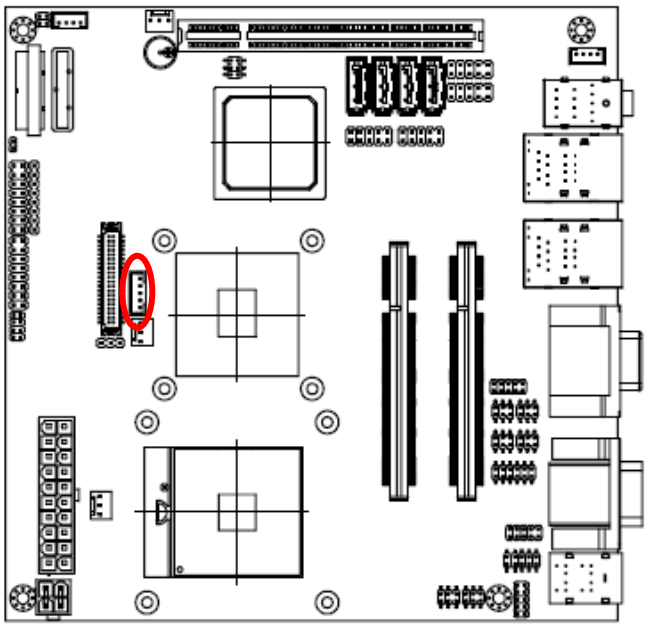
2.4.7 Serial port 4 power select – Ring, +5V, +12V (JP13)





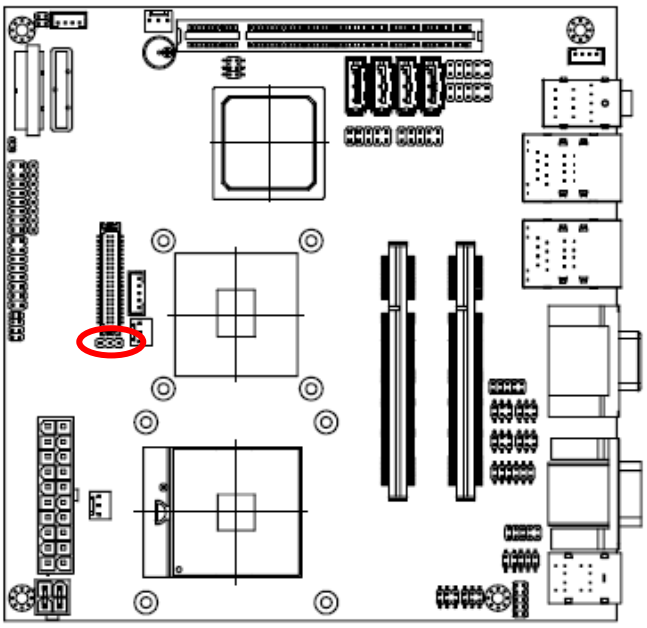
*Default

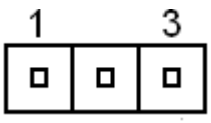
2.4.8 LCD inverter connector (CN4)



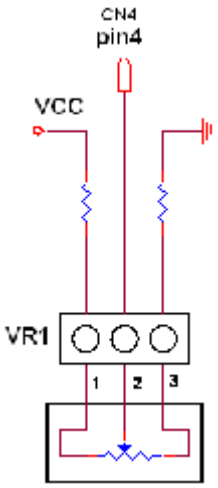
PIN	Signal
1	+12V
2	GND
3	ENBKL
4	VR
5	+5V

2.4.9 LVDS Back Light control connector (VR1)





PIN	Signal
1	+5V
2	BRIGHT
3	GND

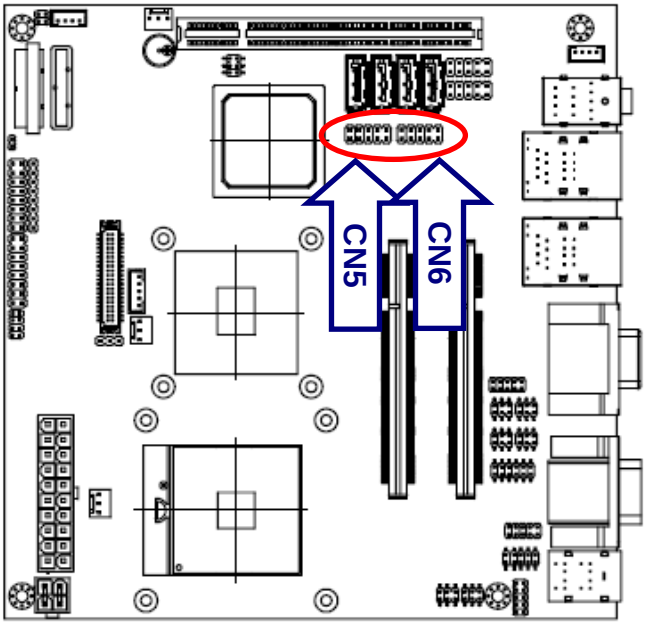


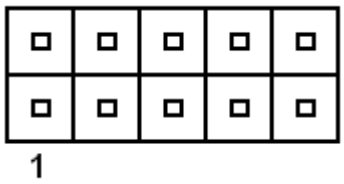
Variation Resistor

(Recommended:

4.7KΩ, >1/16W)

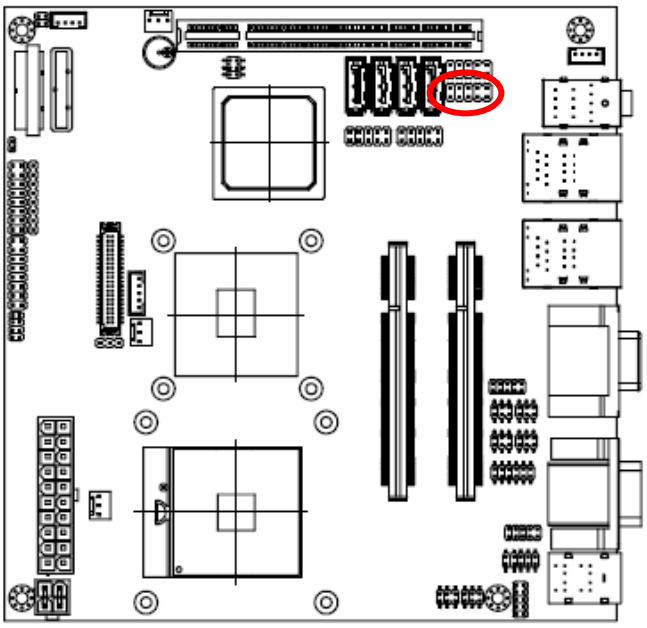
2.4.10 USB connector 4&5/ 6&7 (CN5/CN6)

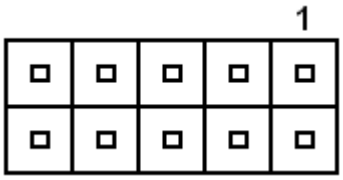




Signal	PIN	PIN	Signal
+5V	1	2	GND
N_P4/6	3	4	GND
P_P4/6	5	6	P_P5/7
GND	7	8	N_P5/7
GND	9	10	+5V

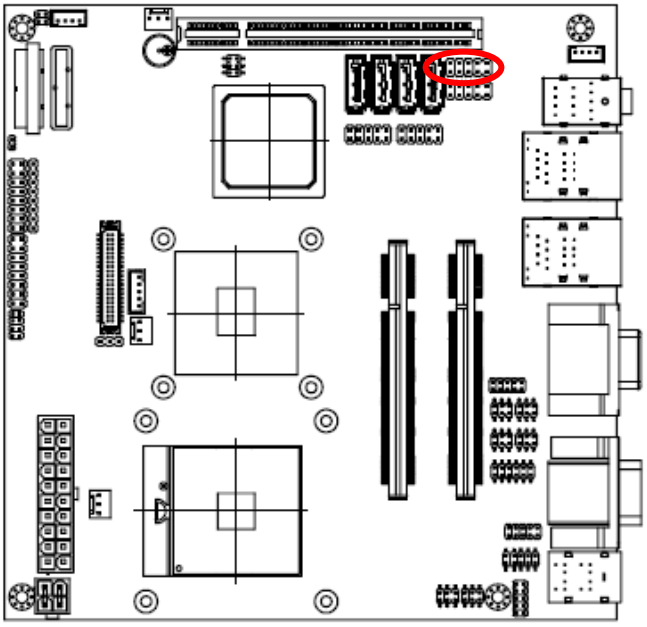
2.4.11 Front Audio connector (CN7)

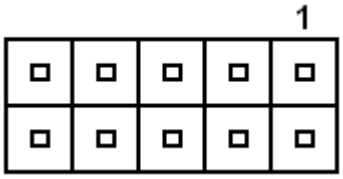




Signal	PIN	PIN	ignal
MIC_L	1	2	GND
MIC_R	3	4	+3.3V
LIN_R	5	6	MIC_JD
FRONT-IO-JD	7	8	NC
LIN_L	9	10	LIN_JD

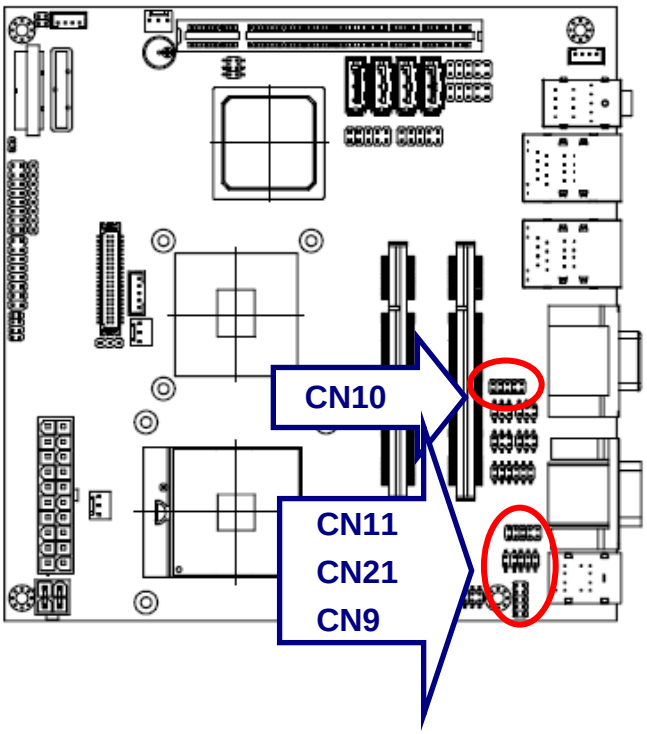
2.4.12 Side Audio connector (CN8)



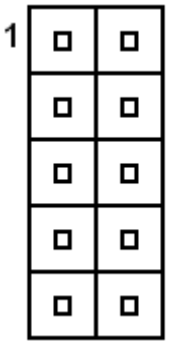


Signal	PIN	PIN	Signal
LFE_OUT	1	2	GND
CEN_OUT	3	4	CEN_JD
SURR_ROUT	5	6	SIDE_R
SURR_JD	7	8	SIDE_JD
SURR_LOUT	9	10	SIDE_L

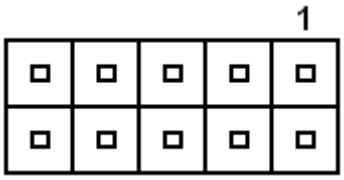
2.4.13 Serial port 3/4/5/6 connector (CN11/ CN9/ CN10/ CN21)



CN9

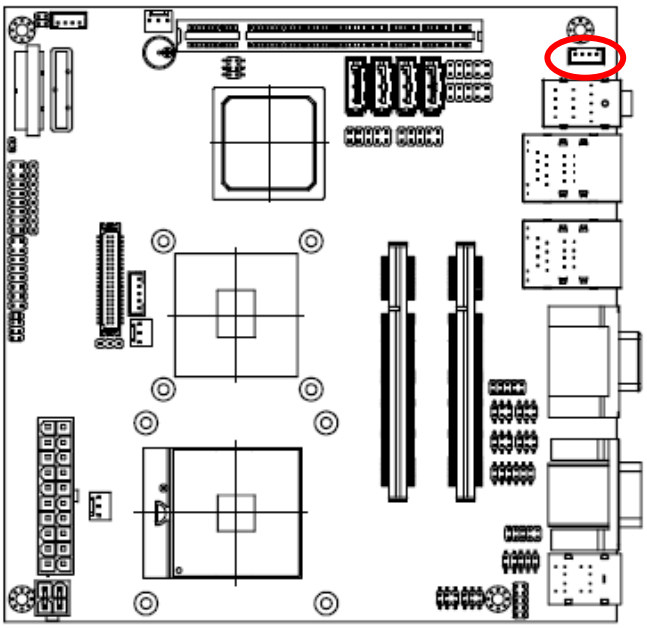


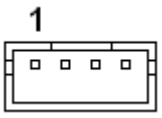
CN10/ CN11/ CN21



Signal	PIN	PIN	Signal
DCD	1	2	RxD
TxD	3	4	DTR
GND	5	6	DSR
RTS	7	8	CTS
RI	9	10	NC

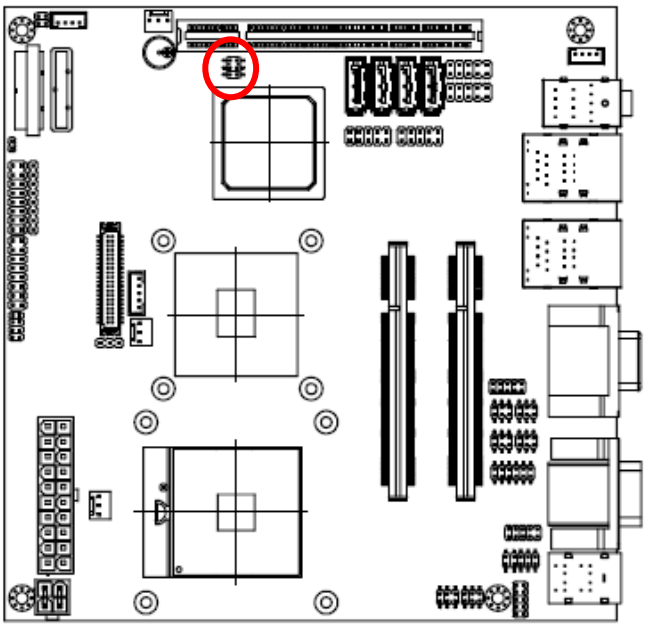
2.4.14 CD-in connector (CN17)

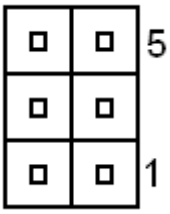




Signal	PIN
GND	1
CD_L	2
GND	3
CD_R	4

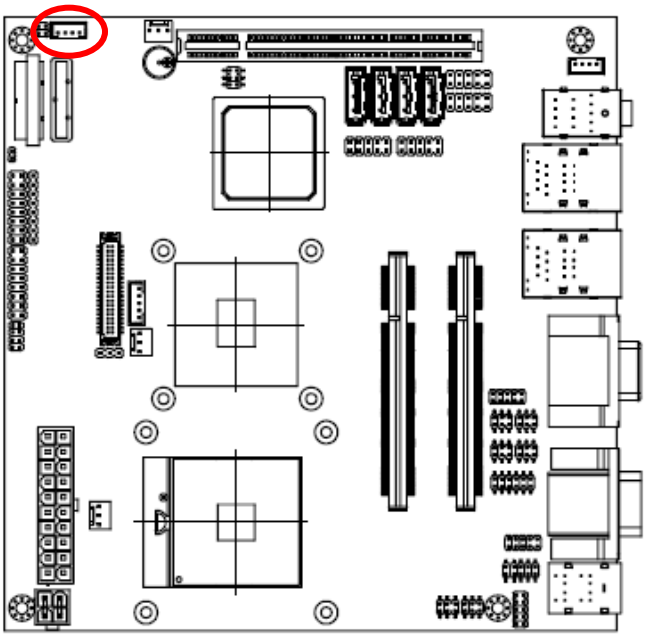
2.4.15 SPI connector (CN20)

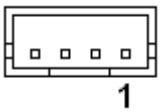




Signal	PIN	PIN	Signal
SPI_SI	6	5	SPI_SO_R
SPI_CLK	4	3	SPI_CS#0
GND	2	1	+3.3V

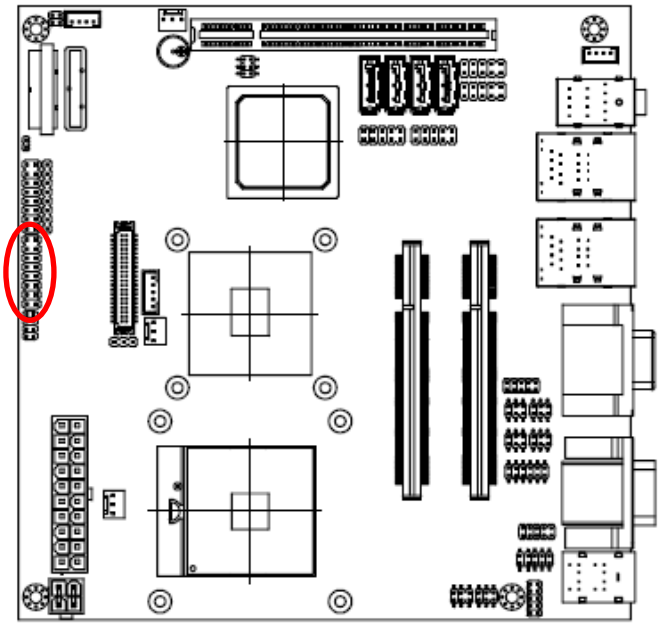
2.4.16 Speaker out connector (CN23)

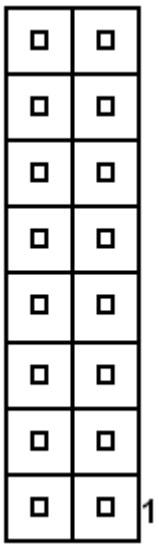




Signal	PIN
AMP_OUT_RP	1
AMP_OUT_RN	2
AMP_OUT_LN	3
AMP_OUT_LP	4

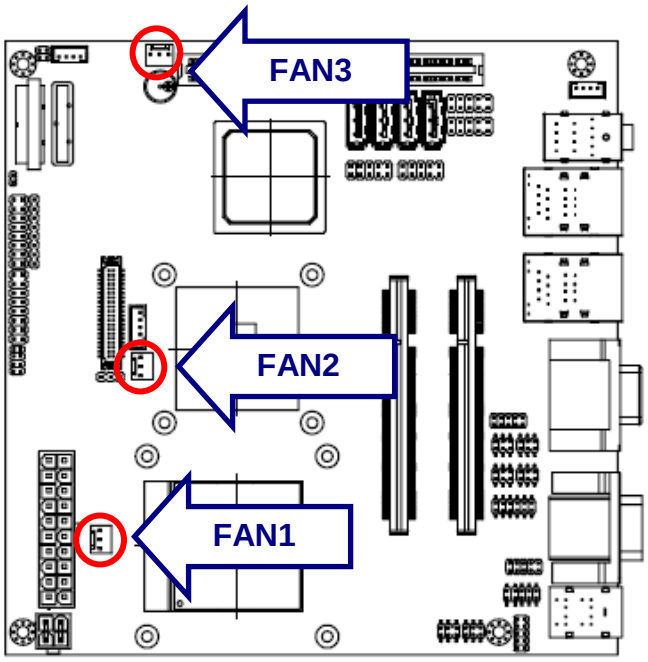
2.4.17 General purpose I/O connector (DIO1)



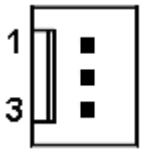


Signal	PIN	PIN	Signal
DO7	16	15	DI7
DO6	14	13	DI6
DO5	12	11	DI5
DO4	10	9	DI4
DO3	8	7	DI3
DO2	6	5	DI2
DO1	4	3	DI1
DO0	2	1	DI0

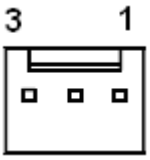
2.4.18 CPU fan/ System fan/ AUX fan connector (FAN1/ FAN2/ FAN3)



FAN1/ FAN2

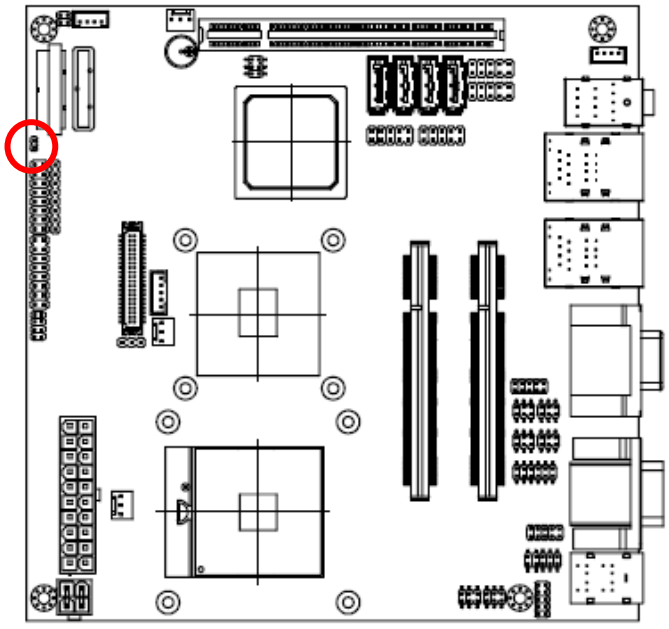


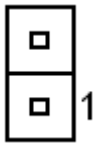
FAN3



Signal	PIN
GND	1
+12V	2
CPUFANIN/ SYSFANIN/ AUXFANIN	3

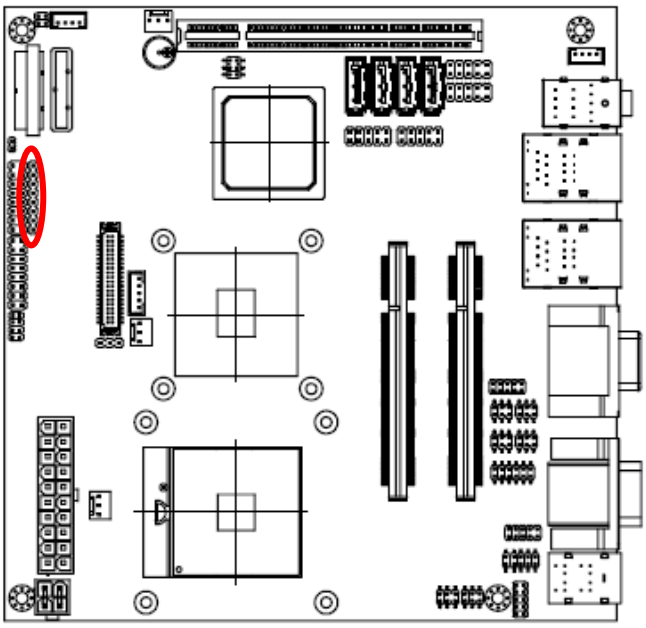
2.4.19 SRAM clear connector (JP2)





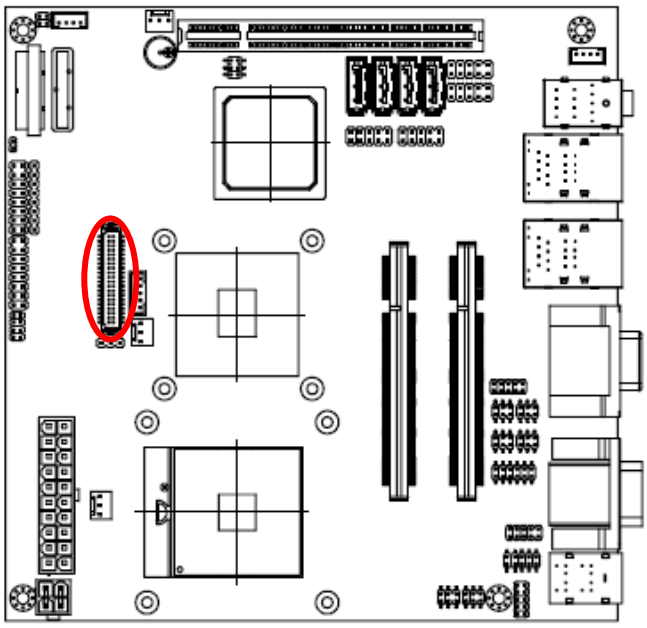
Signal	PIN
SRAM_VDD	2
GND	1

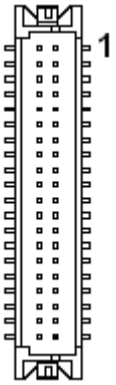
2.4.20 GPLD connector (JTAG2)



Signal	PIN
GPLD_TCK	8
GND	7
GPLD_TMS	6
NC	5
NC	4
GPLD_TDI	3
GPLD_TDO	2
+3.3V	1

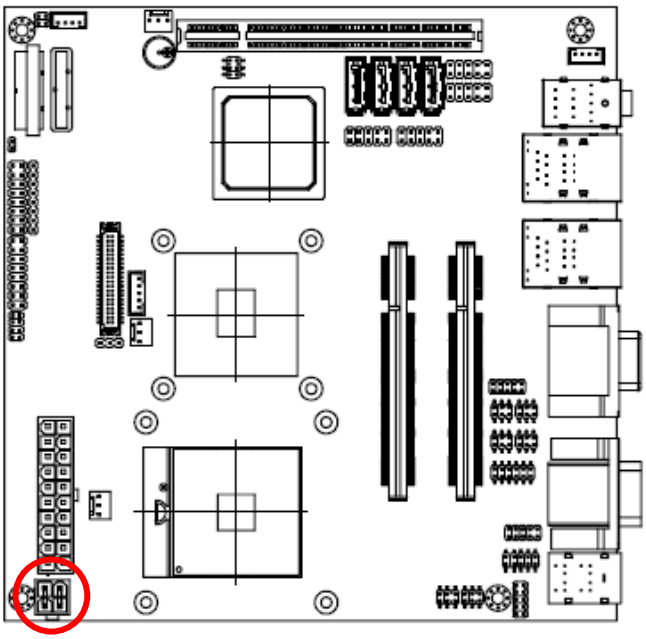
2.4.21 LVDS connector (LVDS1)

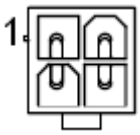




Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
SPDATA	6	5	SPCLK
GND	8	7	GND
YA0P	10	9	YA1P
YA0M	12	11	YA1M
GND	14	13	GND
YA2P	16	15	YA3P
YA2M	18	17	YA3M
GND	20	19	GND
YA4P	22	21	YA5P
YA4M	24	23	YA5M
GND	26	25	GND
YA6P	28	27	YA7P
YA6M	30	29	YA7M
GND	32	31	GND
CLK1P	34	33	CLK2P
CLK1M	36	35	CLK2M
GND	38	37	GND
+12	40	39	+12V

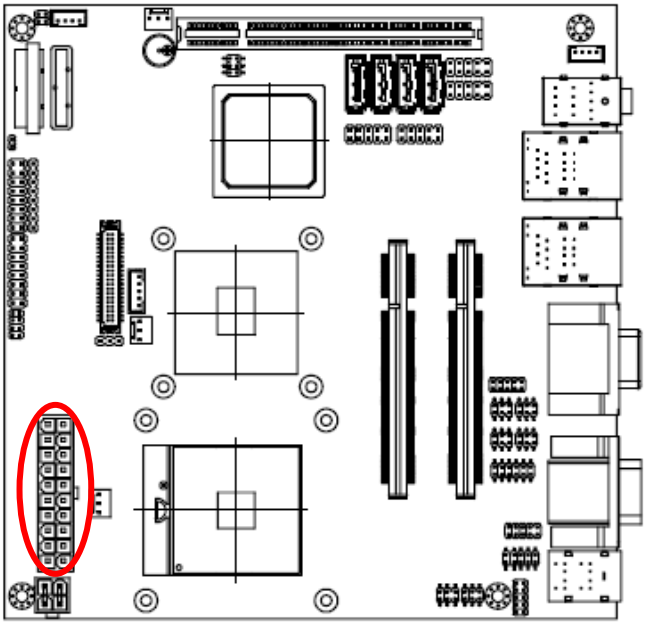
2.4.22 ATX 12V power connector (PWR1)

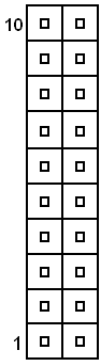




Signal	PIN	PIN	Signal
GND	1	2	GND
+12V	3	4	+12V

2.4.23 ATX power connector (PWR2)





Signal	PIN	PIN	Signal
+12V	10	20	+5V
AUX5V	9	19	+5V
PWROK	8	18	+5V
GND	7	17	GND
+5V	6	16	GND
GND	5	15	GND
+5V	4	14	PSON#
GND	3	13	GND
+3.3V	2	12	-12V
+3.3V	1	11	+3.3V